



Available online at www.sciencedirect.com



Journal of Forensic and Legal Medicine 15 (2008) 227–230

JOURNAL OF
**FORENSIC
AND LEGAL
MEDICINE**
www.elsevier.com/jflm

Original Communication

Police custody deaths in Maryland, USA: An examination of 45 cases [☆]

Pamela Southall MD (Assistant Medical Examiner)^a,
Jami Grant Ph.D. (Director of Forensic Studies)^{b,*},
David Fowler M.B., Ch.B., M.MED (Chief Medical Examiner)^a,
Shauna Scott B.S. (Student)^b

^a Maryland's Office of the Chief Medical Examiner, 111 Penn Street, Baltimore, MD 21201, USA

^b University of Baltimore, 1420 North Charles Street, Baltimore, MD 21201, USA

Received 31 July 2007; received in revised form 24 August 2007; accepted 10 October 2007

Available online 14 February 2008

Abstract

Previous published research suggests there are a diverse, yet relatively consistent, set of factors present in sudden, unexpected, and initially inexplicable deaths in police custody. This retrospective analysis examines police custodial deaths in Maryland, USA. Police custody death is operationalized to include deaths which occurred suddenly and unexpectedly during police/citizen encounters. Only deaths for which the cause was initially undeterminable are included. Suicidal hanging, police shootings and fatal pursuits are not included. Review of the records at Maryland's Office of the Chief Medical Examiner indicates that 45 persons died suddenly and unexpectedly in the custody of the police, between 1990 and 2004. Commensurate with existing research, our analysis identifies multiple factors generally present in this type of police custody death. Although individual-specific, these factors include a relatively static constellation of behavioral (e.g., erratic and/or violent behavior, and physical struggle) and physical (e.g., stimulant abuse, natural disease, and obesity) dimensions. While the presence of these factors has been well-documented, their empirical significance, interactions and causal sequence have yet to be established. To increase the methodological rigor of subsequent research, we have developed a comprehensive, national custody death database by which multivariate models may be analyzed.

Published by Elsevier Ltd and FFLM.

Keywords: Death in custody; Police; Cocaine; Forensic

1. Introduction

Some of the most contentious and controversial medical examiner cases involve deaths that occur suddenly, unexpectedly, and seemingly inexplicably during arrest or while the decedent was in police custody.^{1–6} Initially, the cause and manner of these deaths are undeterminable; often,

there are no anatomical findings at autopsy and most conclusions are predicated on physiologic processes.^{2,5,7} The medical examiner must use all information garnered during the investigation to identify the cause or mechanism of death.^{8–10,3,6}

Research, conducted over the last two decades, has identified a constellation of factors often present in these particular cases of sudden, unexpected, and initially unexplainable deaths. These factors include irrational and/or aggressive behavior,^{1,2,11,12} scuffle and/or physical exertion,^{1,2,4,13} the use of restraints and positioning,^{4,14,15} natural disease,^{3,4,11} and stimulants.^{1,2,4,16} This analysis examines this type of death that occurred in police custody in the state of Maryland to determine if study results

[☆] The authors received no grant support related to this submission.

* Corresponding author. Tel.: +1 410 837 5302; fax: +1 410 837 6051.

E-mail address: jgrant@ubalt.edu (J. Grant).

buttress the extant research by highlighting the diverse, yet relatively consistent, set of salient factors.

2. Methods

A retrospective analysis of the records at Maryland's Office of the Chief Medical Examiner (OCME) was conducted to identify all deaths that occurred suddenly, unexpectedly, and initially inexplicably, in police custody between 1990 and 2004. The jurisdiction includes 23 counties in the state, as well as Baltimore City. Police custody death was operationalized to include deaths which occurred during police/citizen encounters, including field interrogations, arrest procedures and detention. Deaths resulting from suicidal hangings, police shootings and police-related motor vehicle incidents were not included for analysis. Once a case was identified, various reports were examined for relevant information, including the autopsy report, the postmortem toxicology report, police reports, forensic investigator report, and medical records (if present). The following requisites were reviewed for each case: decedent characteristics, incident information, autopsy/toxicology findings, and the cause and manner of death.

3. Results

3.1. Sociodemographic characteristics

Review of the records indicates that between 1990 and 2004, 45 individuals died suddenly, and unexpectedly while in police custody. Results show that an overwhelming majority of deaths that occurred in police custody involved males (93%, $n = 42$) and African–Americans (80%, $n = 36$). Of the male decedents, 79% were African–American. Only 7% of the study decedents were female, all of whom were African–American.

Approximately 78% of the deaths ($n = 35$) occurred in two, predominantly African–American jurisdictions, namely Baltimore City and Prince George's County. While vitally relevant, the jurisdictional arrest rates, aggregated by race and gender, are not available. However, in 2005, the population of each of these jurisdictions was approximately two-thirds African–American.¹⁷ These jurisdictions had majority black populations in 1990, as well.¹⁸ The remaining cases ($n = 10$) occurred in jurisdictions that were majority Caucasian.

The majority of study decedents (73%) were between 20 and 39 years old. Ages ranged from 20 to 68 years old with a mean age of 35.7 years. Decedent weight ranged from 127 to 264 pounds, with an average weight of 186 pounds. Decedent height ranged from 63 to 74 in., with a mean height of 69 in.. Overall, 62% of the decedents were considered overweight or obese. Specifically, 13 (29%) decedents were obese with a body mass index greater than 30, and 15 (33%) decedents were overweight with a body mass index between 25 and 29.9.

3.2. Incident characteristics

The majority of cases involved suspects who exhibited irrational and/or assaultive behavior. Calls to the police for individuals acting irrationally comprised approximately half ($n = 23$) of the incidents. An additional 13% of the calls included domestic disturbances ($n = 3$) and assaults ($n = 3$). Moreover, during seemingly innocuous calls, the circumstances rapidly deteriorated. For example, during one of the "routine" traffic stops the subject, while handcuffed without incident, almost immediately began to exhibit seizure-like activity. Cocaine was subsequently found in the subject's mouth. Paramedics were called to transport the subject, who became hyperthermic and unresponsive en route to the hospital. Forty-four deaths occurred prior to detention, while police were conducting field interrogations or affecting arrests. Only one death occurred during detention, involving a decedent who became unresponsive while in a holding cell awaiting burglary charges.

Handcuffs were used on 89% of the decedents ($n = 40$). Additional restraints were utilized on 21 of these handcuffed persons. Specifically, 16 of these individuals were also restrained with leg irons: 10 persons with leg irons, five persons with leg irons and pepper spray, and one person with leg irons, pepper spray, a taser gun, and a bean bag gun. In addition to handcuffs, two individuals were also sprayed with pepper spray. In three individual cases, persons were restrained by a "blue monster" (a total body restraint device), a carotid hold, and an asp baton and pepper ball gun combination. Of the 45 study decedents, 19 (42%) were placed in a prone position.

3.3. Manner of death

The least common manner of death was natural ($n = 2$), accounting for only 4% of the cases. Of the two natural cases, one cause of death was "hypertensive atherosclerotic cardiovascular disease". The other cause of death was "acute peritonitis due to a perforated gastroduodenal ulcer". At autopsy, both cases were without documented injuries and both had negative toxicology.

Accidents comprised only 9% ($n = 4$) of the deaths that occurred in police custody. Three of these decedents swallowed cocaine during the arrest; of these, two individuals died as a result of "acute cocaine intoxication" and the third from "asphyxiation due to airway obstruction by a foreign object, complicating cocaine intoxication". "Positional and compressional asphyxia, complicating alcohol intoxication" was the cause of death in the fourth case. This case involved the use of the "blue monster" restraint device.

Thirteen percent of the cases were homicides ($n = 6$). Petechial hemorrhages were present in 83% of these cases. One individual had petechiae only; the cause of death was "cardiac arrhythmia following restraint with positional asphyxia in association with atherosclerotic cardiovascular disease". Four decedents had both petechial hemorrhages and toxicology positive for illicit drugs. Causes of death

included: “asphyxiation associated with phencyclidine intoxication”; “compressional asphyxia complicated by cocaine and narcotic intoxication”; “asphyxia during restraint for phencyclidine and ephedrine induced psychosis”; and “cardiac arrhythmia due to an acute psychotic state related to cocaine intoxication and multiple neck and chest injuries related to restraint during police custody”. Neither petechial hemorrhages nor illicit drugs were present in the sixth case; death was due to “cardiac arrhythmia associated with blunt force injuries and prone position occurring during police arrest and restraint”. The decedent, who had a history of schizophrenia, exhibited irrational behavior in a major department store, just prior to arrest.

In the majority of cases, the manner of death was undetermined (73%, $n = 33$). Toxicology results indicated that illicit drugs and ethanol were present in 88% ($n = 29$) of these undetermined cases. Ethanol and/or drug intoxication, described either singly or as associated with substance abuse excited delirium, was the cause of death in 19 of these cases. Agitated delirium was established as the cause of death in five cases, of which two were associated with phencyclidine and three with cocaine. Two of the undetermined cases established physical altercations and restraints within the cause of death: ethanol, cocaine, and morphine were present in one of these cases and phencyclidine was present in the other. A subdural hematoma was the cause of death in one case. This individual was found dead in a holding cell. The circumstances which caused the head injury could not be determined. Eighteen percent of the undetermined cases ($n = 6$), involved natural disease. Specifically, one case of narcotic intoxication associated with coronary artery anomaly; one case of cocaine intoxication with associated myocarditis; one case of cocaine intoxication and associated asthma; one case of cardiac arrhythmia associated with ASCVD; one case of cardiac arrhythmia associated with coronary artery anomaly; and one case of cardiac arrhythmia due to psychotic state complicating myocardial fibrosis.

3.4. Toxicology results

Overall, postmortem toxicology findings indicated that 76% ($n = 34$) of the study decedents were positive for ethanol and/or illicit drugs. Of these cases, two presented with morphine only. Cocaine was the most predominate agent, occurring in 79% of those with a positive toxicologic screen ($n = 27$). Forty-four percent of these cases ($n = 12$) were positive for cocaine only. Of the remaining cocaine-positive cases, 33% ($n = 9$) included morphine, and 11% ($n = 3$) included ethanol. Lastly, three cocaine-positive cases were also positive for diphenhydramine, pseudoephedrine and phenylpropanolamine, and doxylamine, respectively.

Phencyclidine was identified in five cases (11%). Of these cases, two were positive for phencyclidine only. The other three cases presented with phencyclidine in addition to one with ethanol and diphenhydramine, one with ephedrine, and one with fluoxetine and norfluoxetine.

4. Discussion

Consistent with the present findings, previous research indicates that there are certain factors that may render individuals more susceptible to sudden, unexpected and seemingly inexplicable death in police custody.^{9,10,19} Such predisposing factors include drug and/or alcohol intoxication, violent muscle activity, obesity, an enlarged heart, and cocaine-induced bizarre or frenzied behavior. The cardiotoxic effects of various drugs are well-documented in the literature, including stimulants (especially illicit), alcohol, tricyclic antidepressants, anti-psychotics, and cold medicines.³ These drugs, when combined with natural disease and/or a struggle, can precipitate a fatal cardiac event.

The majority of study decedents were overweight (62%), involved in a violent struggle and/or acting irrationally (64%), and had a positive drug/ethanol toxicology (76%). Sixty percent of those who died in police custody were positive for cocaine. An additional eleven percent of the decedents were positive for phencyclidine. These drugs, the former more commonly than the latter, are clearly associated with excited delirium deaths.^{2,3,6,11,13,20} The relatively sizeable number of phencyclidine-positive toxicology results reflect the incidence of use locally; relative to most jurisdictions in the nation, Maryland and Washington, DC have a relatively higher incidence of phencyclidine use.²¹

Autopsy findings indicate that nearly half (47%) of study decedents suffered from natural diseases, in particular heart disease, which may increase the likelihood of a lethal cardiac event.^{3,19} Ironically, lifestyle choices such as dietary and exercise habits, but more specifically chronic stimulant use, may lead to heart disease.^{3,22,23}

Extant literature also documents the use of physical restraint as a factor associated with death in custody. Study results indicate that in the majority of cases, police used a variety of restraints while affecting arrest or maintaining custody. Nearly 90% of decedents were handcuffed, and of these, over half involved the use of additional restraints. The involvement of restraints could not be further delineated because case documentation did not clearly indicate the length of time for which individuals were restrained.

DiMaio and DiMaio contend that researchers have misattributed the causal contribution of restraint in sudden deaths in custody.³ They caution that it may be the violent physical struggle, subsequently mandating the use of restraints, which serves as the catalyst of the fatal event. Research highlights the contribution that a struggle may have on a vulnerable individual, suggesting that it may be a pivotal, contributory insult.³ An individual who is overweight, a chronic stimulant user, and suffering from natural disease is apparently a prime candidate for a sudden, lethal cardiac event when involved in a violent struggle. And while it is accepted that any physical or emotional stress can overburden a heart compromised by any abnormality, research is beginning to examine the role that genetics may play in excited delirium predisposition and sudden death.^{3,24–26}

5. Conclusions

Commensurate with existing literature, our research identifies multiple factors which are generally present in sudden, unexpected, and initially inexplicable deaths occurring in police custody in the USA. Although individual-specific, these factors include a relatively static constellation of behavioral (e.g., erratic and/or violent behavior, and physical struggle) and physical (e.g., stimulant abuse, natural disease, and obesity) dimensions. While the presence of these factors in custodial deaths has been well-documented, their empirical significance, interactions, and sequence have yet to be established.¹⁵ The lack of uniform case documentation, the inconsistent measurement of study variables and the use of small sample sizes have prevented the execution of methodologically rigorous and statistically powerful analyses. To this end we have created a national custody death database, for use by the medical-legal community, in which comprehensive data will be stored. This database will allow for the analysis of multivariate models: an analytic method by which the respective statistical contribution of various factors may be identified. It is hoped that by establishing the empirical significance of the salient factors, we may elucidate the facts and subsequently, develop sound protocols by which the incidence of this type of death in custody may be reduced within the USA. Other models may be appropriate in other geographical regions and jurisdictions.

References

- Mirchandari HG, Rorke LB, Sekula-Perlman A, Hood IC. Cocaine-induced agitated delirium, forceful struggle, and minor head injury: a further definition of sudden death during restraint. *Am J Forensic Med Pathol* 1994;15:95–9.
- Ross DL. Factors associated with excited delirium deaths in police custody. *Mod Pathol* 1998;11(11):1127–37.
- DiMaio TG, DiMaio VJ. Excited delirium syndrome: cause of death and prevention. New York, New York: CRC Press; 2005.
- Stratton SJ, Rogers C, Brickett K, Gruzinski G. Factors associated with sudden death of individuals requiring restraint for ‘excited delirium’. *Am J Emerg Med* 2001;19:187–91.
- Farnham FR, Kennedy HG. Acute excited states and sudden death. *Br Med J* 1997;315:1107–8.
- Pestaner JP, Southall PE. Sudden death during arrest and phencyclidine. *Am J Forensic Med Pathol* 2003;24:119–22.
- Police Complaints Authority. Policing acute behavioral disturbance. <<http://www.mcccj.com/news2002/1218.htm>>; 2002 [retrieved 28.01.03].
- Mittleman RE, Wetli CV. The pathology of cocaine abuse. *Advances in pathology and laboratory medicine*. St. Louis (MO): Mosby-Yearbook, Inc.; 1991. p. 37–73.
- Granfield J, Onnen J, Petty CS. Pepper spray and in custody deaths: international association of chiefs of police executive brief. *Sci Tech*:1–8.
- Spitz WU, Fisher RS. *Medicolegal investigation of death*. Springfield (IL): Charles Thomas Publisher; 1993.
- Pollanen MS, Chiasson DA, Cairns JT, Young JG. Unexpected death related to restraint for excited delirium: a retrospective study of deaths in police custody and in the community. *Can Med Assoc J* 1998;158:1603–7.
- Ruttenber AJ, Lawler-Heavner J, Yin M, Wetli CV, Hearn WL, Mash D. Fatal excited delirium following cocaine use: epidemiologic findings provide new evidence for mechanisms of cocaine toxicity. *J Forensic Sci* 1997;42(1):25–31.
- Chan TC, Vilke GM, Neuman T. Reexamination of custody restraint position and positional asphyxia. *Am J Forensic Med Pathol* 1998;19(3):201–5.
- Reay DT. Death in custody. *Clinics Lab Med* 1998;18:1–22.
- Mohr WK, Petti TA, Mohr BD. Adverse effects associated with physical restraint. *Can J Psychiatry* 2003;48:330–7.
- Fishbain DA, Wetli CV. Cocaine induced psychosis and sudden death in recreational cocaine users. *J Forensic Sci* 1985;30(3):873–80.
- United States Census Bureau. State and County QuickFacts. <www.quickfacts.census.gov>; 2007 [retrieved 20.01.07].
- The Maryland-National Capital Park and Planning Commission. The black community of Prince George’s County; 2003.
- Dolinak D, Matsches E, Lew E. *Forensic pathology: principles and practice*. New York: Elsevier Publishing; 2005.
- Blaho K, Winberry S, Park L, Logan B, Karch SB, Barker LA. Cocaine metabolism in hypothermic patients with excited delirium. *J Clin Forensic Med* 2000;7:71–6.
- National Drug Intelligence Center. PCP: increasing availability and abuse. <www.usdoj.gov/ndic>; 2004 [retrieved 22.02.07].
- Tazelaar HD, Karch SB, Stephens BG, Billingham ME. Cocaine and the heart. *Hum Pathol* 1987;18(2):159–95.
- Karch SB. *Karch's pathology of drug abuse*. Boca Raton (FL): CRC Press; 2002.
- Mash DC, Ouyang Q, Pablo J, et al. Cocaine abusers have an over expression of alpha-synuclein in dopamine neurons. *J Neurosci* 2003;23(7):2564.
- Staley JK, Rothman RB, Rice KC, Partilla J, Mash DC. Opioid receptors in limbic areas of the human brain are upregulated by cocaine in fatal overdose victims. *J Neurosci* 1997;17(21):8225–33.
- Southall PE, Pestaner JP. Overwhelming number of AA deaths occur in police custody. *J Natl Med Assoc* 2003;95(8):754–5.